

Environmental Statistics and Decision Making
Stat 685/485
Spring 2016

- Time:** Monday, 5:15 to 6:30 pm, students must stay the entire period and work in groups;
- Attendance:** Required, students must attend all classes
- Location:** Sewell 207, lab groups are expected to meet other times
- Objective:** Students are expected to acquire the skills to manage large investigations of environmental data from optimal sampling plans to interpretation as both a team lead and team member. Students will gain a clear understanding of the statistical methods, and develop strong communication, planning, and presentation skills.
- Outcomes:** Students will master the environmental statistical methods covered in this course, and attain competence in handling real-world environmental data, presenting and interpreting this data and communicating statistical findings.
- Prerequisite:** Two semesters of basic statistics
- Grading:** Four professional data analysis presentations (12% each), hard copy also required, homework and four homework assessments (40%), no late assignments accepted, Homework assessment 1-3, grading is 100 or 0, 1 retake for 80% or 0 on second try within 1 week, no retake on Homework assessment 4. Homework assessments are individual work under Honor Code, projects are collaborative within group class participation (12%). All students are required to contribute equally to all projects. Part of the student project grade will be based on group member assessment of equal contribution. Each student will be responsible for all aspects of the project. Graduate and Undergraduate students will be graded separately.
- Text:** Instructor text and EPA guidance. Must be printed and brought to class.
- Instructor:** Loren Raun, raun@rice.edu , office hours by appointment

Module 1: Sampling Techniques

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| January 11 | Introduction- class format, software, overview/nature of the problem, identifying the question, sample size, SRS, stratified, systematic |
| January 13 | lecture, group work |
| January 18 | MLK Holiday, no class |
| January 20 | lecture, group work |
| January 25 | lecture, group work |
| January 27 | lecture, group work, homework assessment 1 |
| February 1 | lecture, group work, |
| February 3 | Class Presentation 1 |

Module 2: Exploratory Data Analysis

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| February 8 | normality, central tendency, variability, outlier |
| February 10 | lecture, group work, class ends at 6:00 |
| February 15 | lecture, group work |

February 17 lecture, group work
February 22 lecture, **homework assessment 2**
February 24 **Class Presentation 2**

February 29 to March 6 **Spring Break**

Module 3: Detecting the Presence or Absence of Contamination

March 7 hypothesis tests –compare to a standard, compare to background, multiple comparisons
March 9 lecture, group work
March 14 lecture, group work
March 16 lecture, group work
March 21 lecture, **homework assessment 3**
March 23 **Class Presentation 3**

Module 4: Detection Monitoring/Trend Analysis/Prediction

March 28 correlation (time, space, space/time), regression
 multiple regression, trends
March 30 lecture, group work
April 4 lecture, group work
April 6 lecture, group work
April 11 lecture, group work
April 13 lecture, group work
April 18 **Class Presentation 4**
April 20 lecture, **homework assessment 4**

-Any student with a documented disability needing academic adjustments or accommodations is requested to speak with me during the first two weeks of class. All discussions will remain confidential. Students with disabilities will need to also contact Disability Support Services in the Ley Student Center.

-Course syllabus may be subject to change with reasonable advance notice, as deemed appropriate by the instructor.